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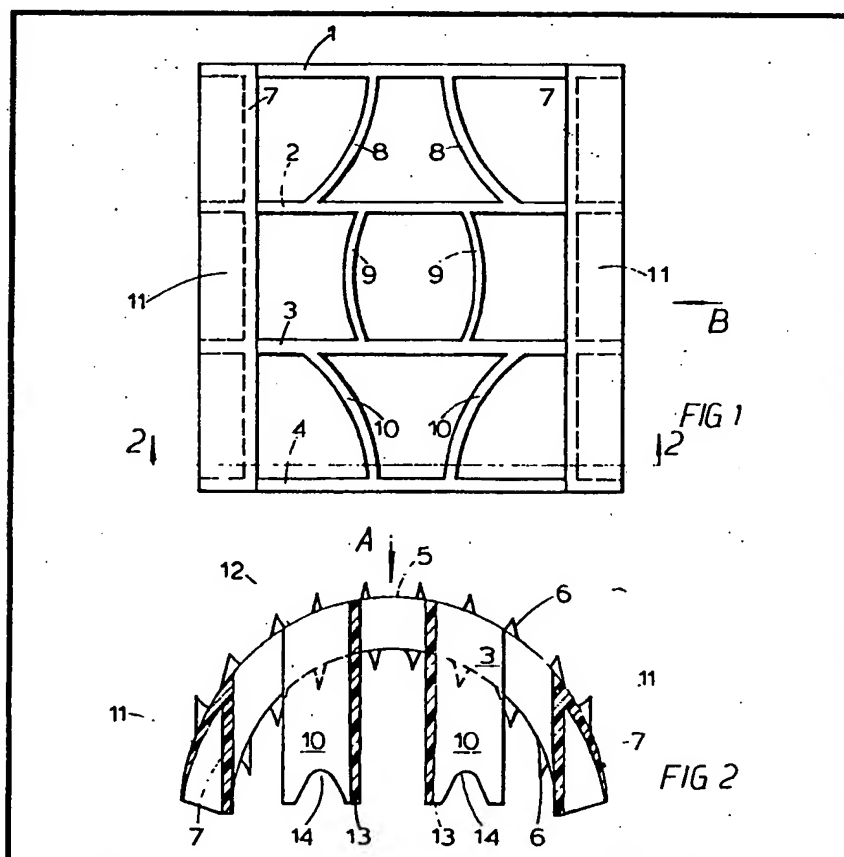
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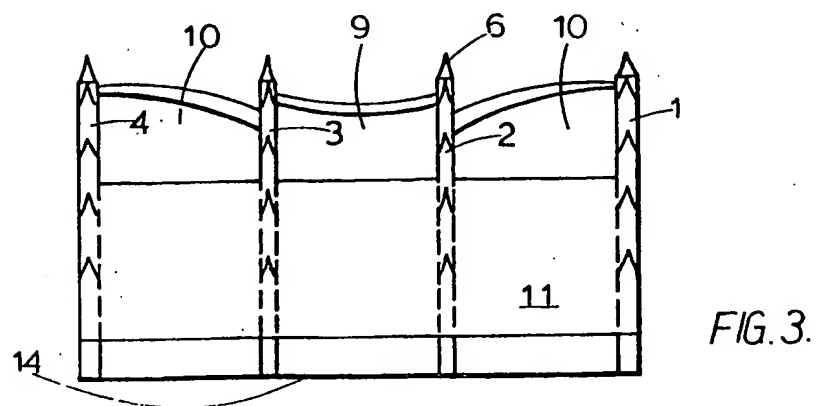
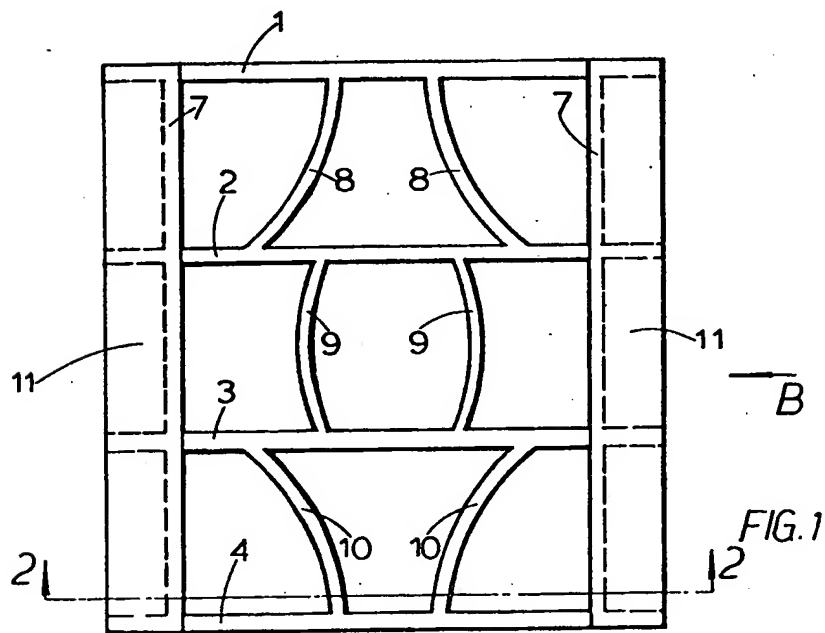
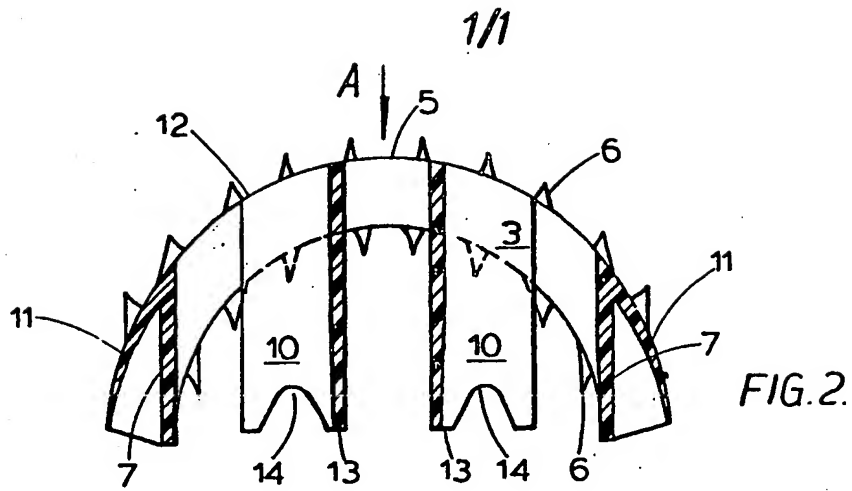
(54) Tower packing element

(57) The packing element has a curved outer profile extending through an angle of 45°-270° and comprises a grating of plates which lie in planes extending substantially normally to a common plane. As illustrated in Figs. 1 and 2, the element has a first series of parallel plates (1 to 4) which are flat and of part-annular outline, and a second series of plates (7 to 10). All of these plates (1 to 4, 7 to 10) extend transversely of the chord interconnecting the free ends of the first series of plates to provide the grating of plates. The element has a relatively high compression strength.



The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy. This print reflects (an) amendment(s) to the request for grant effected pursuant to Rule 35 of the Patents Rules 1978.

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SPECIFICATION

Tower packing element

- 5 This invention relates to a tower packing elements for use in random-poured packed beds in towers and columns, to bring about mass and heat transfer in gas absorptions, distillations, reactors and similar apparatus extensively used in chemical and physical operations.

In the complete specification of my U.K. Patent Application No. 34312/76 are described various packing elements which are of the form of a curved strip provided with apertures and with depending tongues. In some circumstances it is possible for the curved strips to bend under the weight of other packing elements. The present invention stems from attempts to produce an element of greater strength that is more able to resist the forces to which it is subjected by adjacent elements, and thus provide a stable bed with predictable characteristics.

- 15 According to the invention a tower packing element has a curved outer profile which extends through an angle of 45° to 270° , as defined between the normals to the tangents at the opposite ends of the curved profile, and the element comprises a grating of plates which lie in planes extending substantially normally to a common plane.

Preferably the common plane includes that chord which extends between the ends of the curved profile.

Preferably said angle is substantially 180° .

The curved profile is preferably part-circular, but it may be part-elliptical, or part-hyperbolic, for example.

- 40 Such an element is capable of having a relatively open structure which is capable of permitting high liquid throughputs which are desirable in certain processes.

When the element is moulded from plastics materials the arrangement of the plates assists mould release.

- The grating of plates preferably comprises a first series of substantially parallel, spaced-apart, flat plates having a curved outer edge which defines the curved outer profile, the parallel plates being interconnected by a second series of plates. The plates of the second series may be flat plates, but in a preferred arrangement some of those plates are curved plates.

Preferably the plates of the first series are of substantially part-annular outline.

- The plates of the second series preferably extend substantially to said chord in order to prevent undue inter-penetration of the elements.

The opposite end portions of the curved profile are preferably defined by a respective curved end-plate which interconnects the ends of the first series of plates, and the free edge

of each curved end plate is preferably provided with a series of projections to provide additional points of contact between adjacent elements of the bed.

- 70 The inner edges of the second series of plates, those edges adjacent to the chord, are also preferably serrated for the same purpose.

A tower packing element in accordance with the invention will now be described, by way of example only, with reference to the accompanying drawings in which:—

Figure 1 is a plan view of the element looking in the direction of the arrow A in Fig. 2;

- 80 Figure 2 is a cross-section on the line 2-2 of Fig. 1; and

Figure 3 is a view looking in the direction of the arrow B in Fig. 1.

The moulded plastics element comprises a first series of parallel, equally spaced-apart plates 1, 2, 3 and 4 which are flat and of generally part-annular outline, as shown in Fig. 2.

- The plates 1 to 4 are in register with each other when viewed as in Fig. 2, and the radially outer edges 5 of the plates define a curved outer profile to the element. As shown in Fig. 2 the plates 1 to 4 may be provided with projections 6 on the radially outer and/or the radially inner edges to provide an increased number of points of contact or drip promoting points.

A second series of plates consists of a pair of parallel flat plates 7 which extend normally to the first series of plates 1 to 4 and are closely spaced from the respective opposite ends of the curved profile, and three pairs of curved plates 8, 9 and 10 which extend substantially transversely of the chord interconnecting the free ends of the first series of plates.

- As shown in Fig. 1, the first and second series of plates all extend normally to the chord which connects the opposite ends of said curved profile, so that the plates are all edge-on to the viewer with relatively large spaces defined between adjacent plates to permit substantial throughputs of liquid.

A pair of part-cylindrical end plates 11 of oblong-rectangular outline conform to the curved profile of the radially outer edges of the first series of plates 1 to 4, and extend from the outer edge of the respective plate 7 to the free end of said curved profile. The plates 11 may be provided with apertures, not shown to prevent trapping of liquid.

- The plates 8, 9 and 10 have their outer ends 12 flush with said curved profile, and their inner ends 13 are recessed at 14 to provide a pair of projections to act as additional contact points between adjacent elements. Ends 13 lie substantially on the chord extending between the free ends of the plates 1 to 4, as viewed in Fig. 2.

The free edge 14 of each plate 11 may be

serrated to provide additional contact points.
It will be appreciated that this element has a very strong compression strength and can readily be moulded in a two-part mould.

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CLAIMS

1. A tower packing element having a curved outer profile which extends through an angle of 45° to 270° , as defined between the normals to the tangents at the opposite ends of the curved profile, and the element comprises a grating of plates which lie in planes extending substantially normally to a common plane.
2. A tower packing element as claimed in Claim 1 in which the common plane includes that chord which extends between the ends of the curved profile.
3. A tower packing element as claimed in Claim 1 or Claim 2 in which said angle is substantially 180° .
4. A tower packing element as claimed in any of the preceding claims in which the grating of plates comprises a first series of substantially parallel, spaced-apart, flat plates having a curved outer edge which defines the curved outer profile, the parallel plates being interconnected by a second series of plates.
5. A tower packing element as claimed in Claim 4 in which some of the plates of the second series are curved.
6. A tower packing element as claimed in Claim 4 or Claim 5 in which the plates of the first series are of substantially part-annular outline.
7. A tower packing element as claimed in any of Claims 4 to 6 in which the plates of the second series extend substantially to said chord.
8. A tower packing element as claimed in any of Claims 4 to 7 in which the opposite end portions of the curved profile are defined by a respective curved end-plate which interconnects the ends of the first series of plates.
9. A tower packing element as claimed in Claim 8 in which the free edge of each curved end plate is provided with a series of projections to provide additional points of contact between adjacent elements of the bed.
10. A tower packing element substantially as described with reference to the accompanying drawings.